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FURTHER NOTES ON AMERICAN SPIDERS

By W. J. Gertsch

The types of the species diagnosed as new in the following pages are deposited in the collection of The American Museum of Natural History.

LYCOSIDAE

Lycosa pratensis Emerton

Lycosa pratensis Emerton, 1885, Trans. Connecticut Acad. Arts and Sci., VI, p. 483, Pl. xlvi, fig. 4.

Lycosa contestata Montgomery, 1903, Proc. Acad. Nat. Sci., Philadelphia, p. 649, Pl. xxx, fig. 4.

Lycosa orophila Chamberlin and Gertsch, 1930, Pomona College Jour. Ent. and Zoöl., p. 8.

This species is listed by Reimoser as a synonym of *Trochosa robusta* Simon. However, a comparison with European representatives of that and other species shows that it is more closely related to *Trochosa terricola*, of which it is scarcely more than a variety. I have kept it separate because of minor differences that may prove to be constant.

The specific name *orophila* was proposed for a spider that, though agreeing structurally with *Lycosa pratensis*, apparently differed fundamentally in being provided with two teeth on the lower margin of the furrow of the chelicera. Western examples of this species invariably were found to agree in this unusual dental armature. Various European spiders of the genus *Trochosa* (*Trochosina* Simon), with which the species is congeneric, have only two teeth on the lower cheliceral margin.

Variability in the number of teeth on the lower cheliceral margin in the Lycosidae is not uncommon but, within certain limits, the armature is a reliable criterion for the separation of certain genera. The usual variations are the loss of one tooth on each side, the loss of a single tooth on one side, or more rarely the addition of an extra tooth on one or both sides. Large collections of *Lycosa pratensis* Emerton from throughout the United States and Canada are very interesting in regard to the variation of the cheliceral teeth. Generally speaking, it can be rather reliably stated that specimens from the western part of the country have two teeth on the lower margin, while those from the eastern

part have the conventional number. In the northern part of the Mississippi basin, the two types are about equally divided and there seems to be less stability of either formula, many specimens having two on one margin and three on the other. In this connection it is of interest to record the fact that the type of *Lycosa contestata* Montgomery, which is deposited in the collection of The American Museum of Natural History, has four teeth on each of the lower margins of the chelicerae. Three other specimens referred to *contestata* with some question by Montgomery have the conventional three teeth on each side.

The following locality records are given with the object of demonstrating the geographical transition from one type to the other, not as an invariable rule, for some exceptions do occur, but at least to show the tendency in one or the other direction.

DISTRIBUTION.—Two cheliceral teeth on each lower margin. Flagstaff, Arizona, one female. Salt Lake City, Utah (City Creek), August, 1930–1931, six females. Tooele Canyon, Utah, August, 1931, one female. Montpelier, Idaho, July 4, 1928, two females, one male. Nounan, Idaho, August, 1931, three females. Afton, Wyoming, August, 1928, three females. Yellowstone National Park, Wyoming, August 1931–1932, three males, five females (W. E. Gertsch). Comox, British Columbia, female (McDunnough). Edmonton, Alberta, three females. Nepigon Lake, Ontario, one male. Lac des Mille Lacs, Ontario, July, one male. Aweme, Manitoba, August, 1917, one female. Saskatoon, Saskatchewan, one male, one female. Minneapolis, Minnesota, May, 1931–1932, four females. Itasca Park, Minnesota, May 29, 1932, two females. Montreal, Quebec, April 9, 1915, two females (Beaulne). Minaki, Ontario, July 30, one male (Emerton).

Uneven number of marginal teeth, 3–2. Vaudreuil, Quebec, May 27, 1915, one female (Beaulne). St. Jean, Quebec, March 25, 1915, two females (Beaulne). Minneapolis, Minnesota, May, 1931–1932, two females, two males.

Three cheliceral teeth on each lower margin. Montreal, Quebec, April, 1910 and 1915, sixteen females, one male (Beaulne). Vaudreuil, Quebec, May, 1915, one female (Beaulne). Minaki, Ontario, July 30, one male, one female (Emerton). Gaspé coast, 1922, female (Townsend). Fort Coulonge, Quebec, 1918, one male, three females (Beaulne). St. John's, Newfoundland, June 29, 1919, two females (English). Dorval, Quebec, April 20, 1915, female (Beaulne). Ottawa, Ontario, July, male and female. Lac Seul, Ontario, 1919, female (Waugh). Aylmer, Quebec, June, 1915, female (Beaulne). Minneapolis, Minnesota, May, 1931–

1932, seven females, two males. Metlakatla, British Columbia, one male, one female (Keen).

Lycosa sepulchralis Montgomery

Lycosa sepulchralis Montgomery, 1902, Proc. Acad. Nat. Sci., Philadelphia, p. 543, Pl. xxix, fig. 7.

Lycosa modesta Chamberlin, 1908, idem, p. 368 (error in determination).

The type of *Lycosa sepulchralis* is a female that differs considerably from the species usually regarded as *L. modesta* Keyserling. It is a heavier species, has much shorter legs and lacks the prominent markings on the carapace that are present in Keyserling's species. It is closely allied structurally to *Lycosa pratensis* Emerton, from which it may be separated by characters of the epigynum. The male type of *sepulchralis* (allotype) has the scopal element of the palpus much smaller than in *modesta* Keyserling.

Lycosa abdita, new species

Figure 6

Female.—Total length, 5.00 mm. Carapace. 2.86 mm. long, 2.12 mm. wide.

Carapace uniform dark brown in the alcoholic specimen, showing some signs of an indistinct median longitudinal lighter band and side stripes. Sternum, mouth parts and coxae brown. Legs brown, indistinctly annulate. Abdomen uniform black.

First row of eyes as broad as the second, slightly procurved, the medians larger, about one-third of their diameter apart, as far from the laterals. Second row of eyes narrower than the third (26/34), four-fifths of their diameter apart, slightly farther from the eyes of the posterior row. Third row of eyes much narrower than the width of the carapace at that point (34/57), the eyes smaller than those of the second row. Posterior ocular quadrangle broader than long, (34/23). Clypeus equal in height to one-half the diameter of an anterior median eye. Chelicerae with three subequal teeth on the lower margins.

Legs stout, the tibia with 2–2–2 spines beneath, the posterior tibiae with basal and submedian spines above.

Tibia and patella I, 1.92 mm.

Tibia and patella IV, 2.50 mm.

Type Locality.—Female holotype from Gainesville, Florida.

This interesting species is represented by a single female specimen in poor condition. It belongs to the group for which the name *Trochosa* is used by some European authors and agrees well in structure with *Lycosa sepulchralis* Montgomery and *L. pratensis* Emerton. The epigynum differs considerably from that organ in both those species, as shown by the figure. The median septal piece is elongate, not much expanded, and the transverse portion is very narrow.

Lycosa persimilis Banks

Lycosa concolor Banks, 1898, Proc. California Acad. Sci. (3) I, p. 269, Pl. xvi, fig. 25 (not *Lycosa concolor* Kroneberg, 1875).

Lycosa persimilis Banks, 1898, idem, p. 270, Pl. xvii, fig. 2.

Lycosa concolor Chamberlin, 1924, idem, (4) XII, p. 672, Figs. 115 and 116.

Lycosa minnesotensis, new species

Figure 2

Male.—Total length, 7.30 mm. Carapace, 3.66 mm. long, 2.66 mm. wide. Abdomen, 3.66 mm. long, 2.13 mm. wide.

Cephalothorax evenly covered with appressed black and white hairs, the pars cephalica provided with a few spines, those on the clypeal margin longer. Carapace black in color, with a median longitudinal light band that begins at and is scarcely as wide as the last eye row, is weakly constricted a third of its length back, and then continues, narrowing slightly, to the caudal margin. Sides of the carapace with a submarginal, narrow, dentate, lighter band as wide as the marginal black band. Sternum dark; the labium, endites, and coxae light brown. Integument of legs light brown, but the joints are heavily maculate and annulate in black, the covering consisting of numerous spines and black and white hairs. Abdomen black, heavily clothed with appressed hairs, their color corresponding to the pattern, medially with a longitudinal lighter band that continues the length of the abdomen above, is narrowed caudally where it encloses paired yellow spots. Venter lighter.

First row of eyes five-sevenths as wide as the second, slightly procurved, the medians separated by scarcely a diameter and a little nearer the subequal laterals. Second row of eyes seven-ninths as wide as the posterior row, separated by more than a diameter (5/4) larger than the eyes of the last row in the ratio of 6:5. Posterior eyes separated by a little more than three diameters, one and one-half diameters from the eyes of the second row. Quadrangle of posterior eyes broader than long (46/34). Clypeus as high as the diameter of an anterior median eye. Chelicerae armed with three teeth on the lower margin, the distal one considerably smaller.

Legs moderately stout, the tibiae and metatarsi with 2–2–2 spines beneath, the last pair apical, the last two tibiae with a stout basal and median spine above.

Tibia and patella I, 3.75 mm. long. Tibia and patella IV, 4.13 mm. long. Palpus as in *Lycosa avida* Walckenaer.

Female.—Total length, 10.00 mm. Carapace, 4.23 mm. long, 3.16 mm. wide. Abdomen, 6.00 mm. long, 4.00 mm. wide.

The female agrees in structure and color with the male but the dorsal longitudinal streak on the abdomen encloses a basal darker hastate marking that runs half the length above. Five pairs of light spots are usually present laterad of the median light band.

Tibia and patella I, 3.66 mm. long. Tibia and patella IV, 4.13 mm. long. Epigynum as figured.

Type Locality.—Male holotype, female allotype, and many paratypes of both sexes from the sand dunes near Minneapolis, Minnesota, April 27, 1932 (Gertsch collector); female paratypes from Medicine Hat, Alberta, June, 1930 (Carr collector); female paratype from Twin Falls, Idaho, August, 1931 (D. E. Fox collector).

This species is readily separated from *Lycosa avida* by differences in the female copulatory organs. The eyes of the first row are subequal in *minnesotensis* but in *avida* and *mimula* the laterals are somewhat smaller. In color pattern this species more closely approximates *mimula*, but in the latter form the cephalothoracic light bands are evenly margined rather than dentate.

Lycosa mimula, new species

MALE.—Total length, 7.32 mm. Carapace, 3.56 mm. long, 2.73 mm. wide; Abdomen, 3.76 mm. long, 2.43 mm. wide.

Cephalothorax closely clothed with black and white hairs, their distribution agreeing well with the chromatism of the color pattern, the clypeal margin with long black spines. Carapace dark brown, with a median longitudinal light brown band that begins just behind the posterior eyes and is as wide as the interval between them, and continues to the caudal margin with nearly parallel sides. Sides of the carapace brown, the margins dark, with a submarginal straight light band as wide as the brown margin. Eye area brown, medially with a narrow linelike streak of white hairs that ends at the anterior row. Sternum, labium, and endites yellowish brown, the legs little darker and indistinctly annulate on the tibiae and metatarsi. Abdomen gray on the sides, medially with a longitudinal light band enclosing a darker basal hastate maculation. Venter light yellowish-brown.

First row of eyes five-sevenths as broad as the second, the eyes slightly procurved, the medians separated by scarcely a diameter, somewhat nearer the smaller laterals. Second row of eyes seven-eighths as wide as the posterior row, separated by two-thirds of a diameter, larger than the posterior eyes in the ratio 15:11. Last row of eyes separated by about three diameters, half as far from the eyes of the middle row. Quadrangle of dorsal eyes about as long as broad in the ratio 37:40. Clypeus as high as the diameter of an anterior median eye. Chelicerae with three subequal teeth on the lower margin.

Legs rather slender, the tibiae and metatarsi with 2–2–2 spines beneath, the last pair apical, the posterior tibiae with a stout basal and median spine above.

Tibia and patella I, 3.80 mm. long. Tibia and patella IV, 4.23 mm. long. Palpus as figured.

TYPE LOCALITY.—West of Denver, Colorado, September 17, 1931 (Gertsch collector); male holotype in the collection of The American Museum of Natural History.

Lycosa scalaris (Thorell) has long been synonymized with *avida* and there seems to be no good reason to believe it has not been correctly placed. In Thorell's diagnosis the venter is described as being black, and the lateral light bands on the carapace as marginal. Neither of these points is true for the form described above, and they are both more or less constantly characteristic of *Lycosa avida* Walckenaer.

Lycosa watsoni, new species

Figure 7

FEMALE.—Total length, 9.82 mm. Carapace, 4.60 mm. long, 3.80 mm. wide.

Cephalothorax sparsely covered with short brown hairs, the clypeus with four long spines. Carapace brown, medially with a lighter yellow band that goes forward between the third eye row, and at that point is bisected by a narrow black streak from the dark eye area. Median band somewhat expanded behind the third eye row, narrowed caudally. Sides with a submarginal light band and a marginal broken black stripe. Sternum with a dark central maculation. Mouth parts and coxae infuscated, the legs dark brown, the femora somewhat mottled, the distal joints lightened. Dorsum of abdomen black, basally with a pale median spear mark, the sides dark, the venter lighter.

First row of eyes narrower than the second (35/47), distinctly procurved, the medians slightly larger, the eyes equidistantly spaced, scarcely a radius apart. Eyes of the second row less than a diameter apart (12/17). Third row of eyes narrower than the carapace at that point (69/86), smaller than the eyes of the second row. Posterior ocular quadrangle broader than long (69/44). Chelicerae with three teeth on the lower margins.

Legs moderately stout, the tibiae with 2–2–2 spines beneath, the last pair apical, the last two tibiae with stout basal and submedian spines above.

Tibia and patella I, 4.80 mm.

Tibia and patella IV, 5.50 mm.

Epigynum as figured.

TYPE LOCALITY.—Female holotype from Valdosta, Georgia, July 20–21, 1916 (F. E. Watson).

This species is closely related to *Lycosa modesta* (Keyserling) which differs mainly in characters of the epigynum. The median septal piece of this organ is much more expanded distally than in Keyserling's species and the transverse element is decidedly broader. Most of the specimens of *L. modesta* that I have seen lack the median basal lighter marking on the dorsum of the abdomen, and the venter is darker. The marginal dark band on the carapace is broken in *watsoni,* which is not true in *modesta.*

Lycosa helluo Walckenaer

Figure 3

FEMALE.—Total length, 9.00 mm. Carapace, 5.00 mm. long, 3.65 mm. wide.

Cephalothorax clothed with short black hairs, the clypeal margin with several long spines and other smaller ones on the sides of the pars cephalica. Eyes on a black field. Carapace brown, medially with a bright yellowish brown stripe that goes forward slightly farther than the third eye row, is expanded just behind the eyes to nearly the width of the second row, and then abruptly narrows caudally. Sides with broad light submarginal bands and a very narrow marginal black seam. Sternum, mouth parts, coxae, and legs uniform light yellowish brown. Dorsum of abdomen with a black hastate figure at the base that is margined by yellow. Sides of the abdomen black, the venter light.

First row of eyes narrower than the second (38/44), slightly procurved, the eyes equidistantly separated by less than the radius of the larger medians. Eyes of the second row about two-thirds of a diameter apart. Posterior row of eyes broader than the second (56/44), much narrower than the width of the carapace at that point (56/90). Posterior eye quadrangle much broader than long (56/42). Clypeus equal in height to the diameter of an anterior median eye. Chelicerae with three teeth on the lower margins.

Legs moderately stout, the tibiae with three pairs of rather small spines beneath, the last two tibiae with basal and submedian spines above.

Tibia and patella I, 4.60 mm.

Tibia and patella IV, 5.20 mm.

DISTRIBUTION.—I have seen this pale variety of *Lycosa helluo* only from Georgia and Florida.

The broad, pale, submarginal stripes on the carapace will distinguish this variety from *Lycosa modesta, watsoni* and *avida*. The conventional *avida* markings on the venter are lacking and the sternum is without the median dark maculation that is always present in the other species. The median septal piece of the epigynum is only slightly expanded.

Lycosa commota, new name

Lycosa inornata GIEBEL, 1863, Zeitschr. Gesamm. Naturwiss., XXI, p. 313 (not *Lycosa inornata* Blackwall, 1862).

Lycosa giebeli PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., XXIX, p. 559 (not *Lycosa giebeli* Pavesi, 1873).

Lycosa illicita, new name

Lycosa uncata CAMBRIDGE, 1902, 'Biol. Centrali-Americana,' Araneidea, II, p. 328, Pl. XXXI, fig. 22 (not *Lycosa uncata* Thorell, 1877).

Lycosa gulosa Walckenaer

Lycosa gulosa WALCKENAER, 1837, 'Histoire naturelle des Insectes Aptères, I, p. 338.

Lycosa kochii EMERTON, 1885, Trans. Connecticut Acad. Arts and Sci., VI, p. 485, Pl. XLVI, fig. 6 (not *gulosa* Walckenaer).

Lycosa nigraurata MONTGOMERY, 1902, Proc. Acad. Nat. Sci., Philadelphia, p. 564, Pl. XXX, fig. 53.

Lycosa purcelli MONTGOMERY, 1902, idem, p. 566, Pl. XXX, figs. 30 and 31.

Walckenaer's description of this species is so brief that the propriety of using his name is to be questioned. The following two species were synonymized with *gulosa* in 1908, but a study of more material, including the types, convinces me that they are distinct. *Lycosa gulosa* is common in the northern part of the United States but has not been collected west of the Rocky Mountains.

Lycosa pulchra (Keyserling)

Tarentula pulchra KEYSERLING, 1876, Verh. k.k. zool.-bot., Gesell., Wien, XXVI, p. 628, Pl. I, figs. 13 and 14.

Lycosa insopita MONTGOMERY, 1904, Proc. Acad. Nat. Sci., Philadelphia, p. 280, Pl. XVIII, figs. 3 and 4.

This fine species has been collected only in Texas and Florida but no doubt will be found in other southern States.

Lycosa euepigynata Montgomery

Lycosa euepigynata MONTGOMERY, 1904, Proc. Acad. Nat. Sci., Philadelphia, p. 279, Pl. XVIII, figs. 1 and 2.

The types of this species and *Lycosa insopita* are in the collection of The American Museum of Natural History. Both were described from Texas.

Arctosa furtiva, new species

Figure 4

MALE.—Total length, 4.50 mm. Carapace, 2.40 mm. long, 1.67 mm. wide. Abdomen, 2.30 mm. long, 1.50 mm. wide.

Cephalothorax provided with a few black hairs in the eye region and on the clypeal margin, and several inconspicuous erect hairs on the midline. Carapace black, smooth and shining. Sternum yellow, infuscated, the mouth parts and coxae yellow. Integument of the legs dirty yellow, the joints annulate in black as follows: femora with basal, median, and distal rings, the patellae with a single median ring, and the tibiae with a basal and a distal black ring. Distal joints showing slight traces of black annulae. Dorsum of the abdomen black, with a pair of large yellow maculations at the base and smaller spots behind. Venter gray.

Eyes occupying one-fifth of the length of the carapace. First row as broad as the second, very weakly procurved, the medians a radius apart, half as far from the slightly smaller laterals. Clypeus equal in height to the diameter of an anterior median eye. Second row of eyes narrower than the third (17/22), the eyes separated by three-fourths of a diameter, a little farther from the smaller eyes of the third row. Posterior eye quadrangle broader than long (22/18). Chelicerae with three subequal teeth on the lower margin.

Legs stout, the second tibiae with 1–1–2 spines, the others with 2–2–2 spines beneath, the metatarsi with three pairs. First two tibiae unarmed above, the last two with a basal bristle and a submedian spine.

Tibia and patella I, 1.70 mm. long.

Tibia and patella IV, 2.00 mm. long.

Palpus as figured, practically identical with that of *Arctosa funerea* (Hentz). Distal apophysis of the bulb longer than in *A. absoluta*, new species.

FEMALE.—Total length, 4.25 mm. Carapace, 2.15 mm. long, 1.50 mm. wide. Abdomen, 2.10 mm. long, 1.60 mm. wide.

Coloration and structure as in the male. Epigynum identical with that organ in *Arctosa funerea* and *noctuabunda*.

TYPE LOCALITY.—Male holotype, female allotype, and immature paratype from Lake County, Florida, November 4, 1933, and an immature female paratype from Sugarfoot, near Gainesville, Alachua County, Florida, September 3, 1933, collected by Mr. Howard K. Wallace, who has generously given the types to The American Museum of Natural History.

This interesting little species has its nearest relatives in *Arctosa funerea* and *chamberlini*. It agrees with the latter species in having the femora banded, but is different in eye relations and palpus. The palpi of *funerea* and *furtiva* are practically identical but, when the two species are placed side by side, several important structural differences are apparent. The cephalic portion in *furtiva* is very broad, the last eye row occupying at that point a little more than half the width (22/38). In *funerea* the cephalic portion is much narrower and the third eye row is over two-thirds (23/30) of the greatest width. The first row of eyes is much more strongly procurved in *funerea* and the femora are invariably dark, never annulate in black and white.

Arctosa absoluta, new species

Figure 1

MALE.—Total length, 4.25 mm. Carapace, 2.31 mm. long, 1.59 mm. wide. Abdomen, 2.00 mm. long, 1.10 mm. wide.

Cephalothorax provided with a few erect black hairs on the midline and some gray hairs in the eye area, otherwise smooth. Carapace yellow, with two irregular black bands above and a narrow marginal black seam; the eye quadrangle black. Sternum, mouth parts, and coxae yellow, sparsely clothed with black hairs. Legs concolorous with the sternum, the last pair with very faint dark rings, thickly clothed with black hairs and long spines. Abdomen yellow beneath, the dorsum with a median longitudinal light band, the sides with large black maculations that form lateral bands.

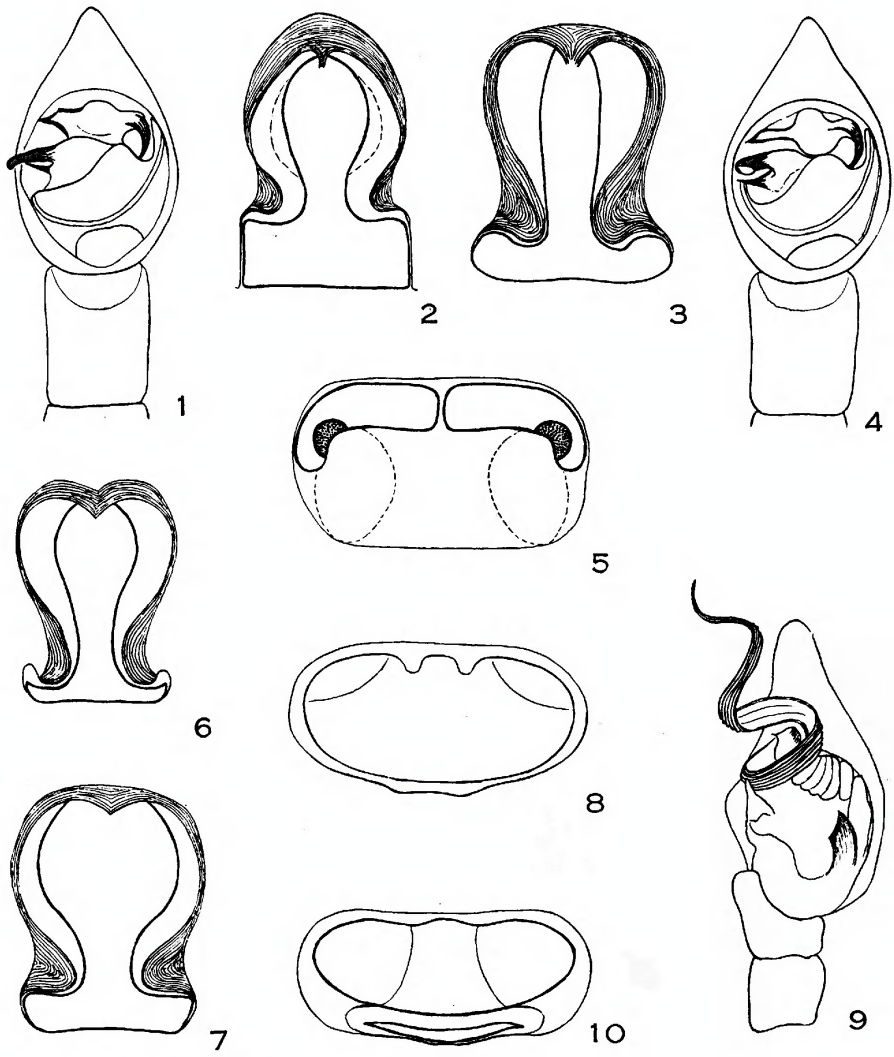
First row of eyes slightly narrower than the second, very weakly procurved, the medians separated by scarcely a radius, nearer the smaller laterals. Clypeus equal in height to two-thirds the diameter of an anterior median eye. Second row of eyes four-fifths as wide as the third row, the eyes large, separated by three-fourths their diameter from each other, a little more than a diameter from the eyes of the third row. Quadrangle of posterior eyes a little broader than long. Chelicerae with three teeth on the lower margin.

Legs stout, the first, third, and fourth tibiae with 2–2–2, the second tibia with 1–1–2 spines beneath, the metatarsi with 2–2–2 spines beneath. The first two tibiae unarmed above, the last two with a basal bristle and a submedian spine.

Tibia and patella I, 1.75 mm. long.

Tibia and patella IV, 2.20 mm. long.

Palpus as figured. Bulb and apophyses of the *Allocosa* type, the scopus a heavily sclerotized, black, curved process directed ventrad, at the base of which is a fine spine. Distal apophysis a short stout spur.



PALPI AND EPIGYNA

Fig. 1. *Arctosa absoluta*, new species.
Fig. 2. *Lycosa minnesotensis*, new species.
Fig. 3. *Lycosa helluo* Walckenaer.
Fig. 4. *Arctosa furtiva*, new species.
Fig. 5. *Agelena idahoana*, new species.
Fig. 6. *Lycosa abdita*, new species.
Fig. 7. *Lycosa watsoni*, new species.
Figs. 8–9. *Agelena barrowsi*, new species.
Fig. 10. *Agelena aperta*, new species.

TYPE LOCALITY.—Male holotype from Edinburg, Texas, collected by Mr. Stanley Mulaik.

This species differs from *Arctosa funerea, chamberlini* and *furtiva*, to which forms it is closely related in structure, in the unbanded legs, in having the light carapace distinctly striped in black, and in small differences in the character of the scopus and distal apophysis of the bulb of the male palpus.

PISAURIDAE

Dolomedes pinicola (Hentz)

Micrommata pinicola HENTZ, 1850, Jour. Boston Soc. Nat. Hist., VI, p. 287, Pl. x, fig. 14.

Teippus lamprus CHAMBERLIN, 1924, Proc. U. S. Nat. Mus., LXIII, p. 28.

SALTICIDAE

Peckhamia idahoana, new species

Figures 11 and 12

MALE.—Total length, 2.76 mm. Carapace, 1.32 mm. long, 0.80 mm. wide. Abdomen, 1.42 mm. long, 0.80 mm. wide.

Integument of the carapace almost completely devoid of hairs or spines, the frontal margin with a few short black spines, and a few white scales at the position of the median suture. Carapace nearly black, with a purplish luster that is due to tiny, iridescent scales, the eye tubercles darker. Under parts of the cephalothorax and the legs dark to light brown, the last two pairs with narrow black side stripes. Abdomen glistening black, a white transverse band at the constriction of the abdomen, the venter black.

Carapace flat above, the sides almost vertical, the posterior declivity beginning just behind the last eye row and dropping to the caudal margin. Area of the eyes occupying nearly three-fourths of the total length of the carapace. First row of eyes recurved, a line along the upper margin of the medians cutting the upper third of the laterals, the medians much larger than the laterals (8/4), equidistantly spaced. Second row of eyes slightly narrower than the first, half as far from the anterior lateral as from the posterior eye. Third row of eyes submarginal, broader than the first (28/25), the eyes subequal. Quadrangle of posterior row and the anterior laterals slightly longer than broad (30/28) but apparently much more so. Clypeus one-fifth as high as the diameter of an anterior median eye.

Leg formula 1423, the first leg considerably enlarged and much longer, the patella and tibia thickened, four-fifths as long as the carapace, the tibia armed beneath with 2–2–2 spines, the distals minute, the metatarsus with two pairs. Chelicerae with a single simple tooth on the lower margin. Sternum suboval, the labium broader than long, about a third as high as the endites. Abdomen with a strong constriction one-third of the length back, the sides otherwise subparallel, the caudal margin rounded.

Male palpus heavy, the patella a little longer than the tibia, which is armed with a slightly curved, black spur. Bulb considerably expanded, the embolic portion heavy at the base, the embolus proper a heavy curved spine.

The immature female allotype (total length, 2.40 mm.) agrees structurally with the male.

TYPE LOCALITY.—Male holotype, paratype and female allotype from Hollister, Idaho, May 20, 1931 (D. E. Fox).

This interesting new *Peckhamia* differs from the other species from the United States in having a simple, rather than a compound tooth on the lower cheliceral margin. Moreover, it differs from *Peckhamia picata* and *americana*, in the longer eye quadrangle, which occupies three-fifths of the length of the carapace. In many respects it is nearer *P. scorpiona* but has a simple tibial apophysis.

Phidippus altanus, new species

Figure 13

MALE.—Total length, 9.35 mm.

Integument of the carapace black, clothed rather sparsely with short black hairs, those of the frontal margin more conspicuous, curling over the eyes of the first row. Clypeal region reddish brown. Chelicerae iridescent. Sternum, mouth parts and coxae brown, shining, the covering of black hairs inconspicuous. Legs dark brown to black, the first leg enlarged and fringed with black hairs, the patella with a gray fringe; the second leg like the first; the last two pairs less conspicuously fringed, the tibia and metatarsi with distinct light basal annulae which are overlaid with white scales. Dorsal surfaces of legs with a few white scales, the palpi black. Integument of the abdomen black, the dorsum covered basally and on the sides with red hairs, the interval between forming an irregular median black band that goes no farther forward than the middle of the dorsum, at which point are two red spots.

Carapace, 4.20 mm. long, 3.65 mm. at the broadest point behind the third eye row. The cephalic portion flat above, the moderately expanded sides convex, the posterior declivity abrupt and beginning just behind the middle of the carapace. First row of eyes recurved, the medians much larger (24/14), scarcely a fifth of a diameter apart, twice as far from the laterals. Eyes of the second row very small, half as far from the anterior lateral eye as the eye of the last row (15/30). Third eye row eight-elevenths as broad as the carapace at that point, broader than the first row (40/24), the eyes two-thirds as large as the anterior laterals. Quadrangle of eyes about three-sevenths as long as the length of the carapace.

Legs 1423, the first tibia with three pairs of stout, short spines on the distal half of the ventral surface. Labium longer than broad, three-fifths as long as the endites which are armed on the outer side at the distal margin with a small tubercle. Chelicerae with a single tooth on the lower margin of the furrow. Sternum much broader than long, the last coxae subcontiguous, the enlarged first coxae separated by two-thirds the sternal width.

Male palpus clothed with black hairs, the patella twice as long as the tibia, which is armed on the outer side with a stout, distally slightly curved spur. Bulb as in *Phidippus ardens* Peckham, the embolus a very short, heavy process as in that species.

FEMALE.—Total length, 10.50 mm. Carapace, 4.75 mm. long, 4.10 mm. wide.

Cephalothorax clothed as in the male, the integument of the eye area black, the remainder dark reddish-brown. Palpus and clypeus with long white hairs, the chelicerae iridescent green on the distal outer surface. Eyes as in the male. Legs provided with more white scales and hairs than in the male, all weakly fringed beneath. Abdomen with either red or yellow narrow, irregular side bands, the interval between broad, as long as the dorsum and overlaid with small, shining black scales.

Epigynum resembling that of *P. ardens*, the caudal margin deeply notched as in that species, the distal half of the plate a shallowly excavated, rounded depression.

TYPE LOCALITY.—Male holotype, female allotype, and paratypes of both sexes from Slough Creek, Yellowstone National Park, Wyoming (W. E. Gertsch). Numerous paratypes of both sexes from the following localities in Alberta: Seba, June and July; Devil's Lake, July; MacMurray, September; Waterton Lake, September; Medicine Hat, August; Fawcett, May. Also from Cypress Hills, Saskatchewan, July.

This species falls into Peckhams' group of red spiders, though the females may be red or yellow in life. The male palpus is closely related to those of *Phidippus ardens* Peckham, *P. apacheanus* Chamberlin and Gertsch, and *P. purpuratus* Koch. In the first two forms the abdomen is all red above, in no case banded as in *P. altanus*, and in addition *P. apacheanus* has the carapace covered with bright red hairs. *Phidippus purpuratus*, belonging in the group in which the abdomen is gray and spotted, need not be considered. None of these other species have been taken as far north as the region where this new form is a common and characteristic element of the salticid fauna.

Phidippus kaibabensis, new species

Figure 19

MALE.—Total length, 8.00 mm.

Integument of the carapace dark reddish-brown, nearly black at the caudal margin and in the eye quadrangle, the frontal margin with long black hairs. Clypeal region light reddish-brown in color, clothed with gray hairs. Chelicerae slightly iridescent, the mouth parts, sternum, and coxae brown, sparsely clothed with black hairs. Legs reddish brown, the femora infuscated, the tibiae, metatarsi and patellae with distal black annulae. Femur of the first leg with a basal bunch of white hairs beneath, otherwise fringed in black, the patella with white hairs beneath, the tibia with a long black fringe. The other legs with black and white hairs and some white scales. Integument of the abdomen black, with a median red maculation and two pairs of transverse markings behind, the whole of the dorsum apparently covered in living specimens with white scales. Venter gray.

Carapace, 3.60 mm. long, 3.15 mm. at the broadest point, just behind the third eye row. Cephalic portion flat above, moderately expanded on the sides. First row of eyes recurved, the medians separated by one-fifth of their diameter, twice as far from the laterals, which are much smaller (25/15). Eyes of the second row very small, much nearer the anterior lateral eye than the posterior (17/28). Third eye row four-

fifths as wide as the width of the carapace at that point, broader than the first eye row (77/66), the quadrangle formed by these eyes much broader than long (77/46). Legs 1423, the first tibia with three pairs of stout spines beneath, placed in the distal half of the joint.

Male palpus clothed with black hairs, the patella slightly longer than the tibia, which is armed on the outer side with a short, stout, hooked spur. Bulb as in *Phidippus arizonensis* Peckham, the embolus a slender spur strongly bent at the distal end.

TYPE LOCALITY.—Male holotype from the Kaibab forest, near the north rim of the Grand Canyon, Arizona, July 8, 1931 (Gertsch).

This species differs from *P. arizonensis* in the following characters. It completely lacks dorsal bands of white hairs on the carapace and has a variegated fringe of black and white hairs beneath the first leg, rather than the bright yellow hairs of the other species. The carapace shows no trace of the pronounced tubercles present in most examples of *arizonensis* and lacks curled tufts of strong black hairs in the eye area.

Phidippus peritus, new species

Figure 18

MALE.—Total length, 14.25 mm.

Integument of the carapace dark red, the eye area darker, clothed evenly with short black hairs, the frontal margin with longer hairs. Chelicerae iridescent green. Under side of the cephalothorax reddish brown, the legs darker and fringed as follows: first leg with a black fringe above and below on the femur, the patella with a ventral white fringe, the remaining joints with scattered gray and black hairs above, the ventral surfaces with a heavy fringe of black hairs; second legs much as the first; last two legs with numerous dark hairs on all surfaces. Dorsum of the abdomen covered with red hairs, the caudal end with two narrow black stripes, the sides and venter darker.

Carapace, 4.62 mm. long, 4.25 mm. at the broadest point. The cephalic portion of the very broad carapace flat above, considerably expanded on the sides, convex, the posterior declivity beginning two-thirds of the length back and abruptly dropping to the caudal margin. First row of eyes recurved, the very large medians scarcely half a diameter from the clypeal margin, less than a fifth of a diameter apart, twice as far from the laterals, the diameters of which are half as great as the medians. Eyes of the second row very small, two-fifths as far from the anterior lateral as the eye of the last row. Third row of eyes broader than the first (11/8), occupying three-fourths of the width of the carapace at that point, the eyes on black tubercles. Ocular area nearly half of the length of the carapace.

Leg formula 1423, the first leg greatly enlarged and much larger than the others, the tibia and patella taken together longer than the carapace, the tibia with three pairs of short, stout spines beneath the distal half. Labium longer than broad, three-fifths as long as the endites, which are armed on the outer side with a well-developed hook. Chelicerae armed with a single tooth on the lower margin. Sternum much longer than broad, the enlarged first coxa separated by its width, the last coxae subcontiguous.

Male palpus covered with long black hairs, the femur strongly bent, as long as the tarsus, the patella a little longer than broad, nearly twice as long as the tibia. Tibial apophysis nearly parallel with the joint for most of its length, gently curved

down at the end. Bulb as in *P. ardens* Peckham, the embolic portion considerably longer, the bulb proper a rounded lobe, behind which is a short spur that remains hidden when viewed from the ventral aspect.

TYPE LOCALITY.—Male holotype from Live Oak County, Texas, June 6, 1919 (Barnum Brown).

This species runs to *Phidippus ardens* in the Peckhams' key to the red spiders. *P. peritus* is a much larger species, has the carapace proportionately much broader and higher, and has the patella and tibia of the first leg longer than the carapace (about equal in *ardens*).

Phidippus adumbratus, new species

Figure 14

MALE.—Carapace, 3.65 mm. long, 3.00 mm. wide.

Integument of the carapace brown, clothed with black hairs and white scales. Clypeus and sides of carapace overlaid with white scales, continuous with a narrow frontal band behind the first eye row. Chelicerae dark brown, slightly iridescent, covered with long, silky white hairs. Under side of carapace light brown, the legs banded as follows: femur of the first leg basally white, distally black, heavily fringed above and below with black hairs; patella with a white fringe below, tibia overlaid with white scales above on the basal halt, the remainder black, the joint fringed with black hairs below; the metatarsus with a distal black ring. Other legs less conspicuously ornamented than the first but with annulae as in the first leg, more evenly clothed with white scales.

Ocular area about two-fifths as long as the carapace. Eyes of the first row recurved, the medians much larger than the laterals (23/12), separated from each other by one-sixth of their diameter, twice as far from the laterals. Eyes of the second row very small, much nearer the anterior than the posterior eye (12/26). Third row of eyes broader than the first (38/31), nearly as broad as the width of the carapace, which is only slightly expanded on the sides. Labium longer than broad, three-fifths as high as the endites, which have a tubercular hook on the outer distal margin. Chelicerae with a single tooth on the lower margin. Leg formula 1423, the first leg greatly enlarged, armed with the conventional three pairs of distal spines on the ventral surface of the tibia, the tibia and the patella equal to the length of the carapace.

Palpus rather short, yellow, clothed with long white hairs. Femur about as long as the tarsus, almost twice as long as the subequal patella and tibia, the latter joint with a black, ventrally directed spur, slightly hooked at the end when seen from the ventral aspect. Bulb closely resembling that of *P. putnami*, but the embolus a much finer, strongly curved tube.

TYPE LOCALITY.—Male holotype from Los Angeles, California (Grant).

The abdomen is missing from the above described species but the characters of the legs and carapace are so important and distinctive that I do not hesitate to give it a name. While this species is closely related

to the group including *Phidippus coccineus*, *putnami* and *femoratus*, it may be easily separated by the characters of the first leg.

Phidippus concinnus, new species

Figure 17

MALE.--Total length, 6.00 mm.

Integument of the carapace reddish brown, clothed evenly with fine black hairs, the frontal margin with numerous longer curved hairs. Carapace with conspicuous white stripes on each side, made up of white scales, margining the carapace behind but not on the frontal margin. Under side of cephalothorax light brown, the legs darker. Chelicerae reddish brown, not iridescent, covered with long white hairs. Legs with scattered white scales above, the first femur nearly black, fringed beneath with black hairs, the patella lighter and with a white ventral fringe, the tibia distally black and fringed with hairs of that color. The third and fourth legs with black distal annulae on the tibia and metatarsi. Abdomen red above, with a single, broad, irregular median black band, the venter gray.

Carapace, 3.15 mm. long, 2.65 mm. broad.

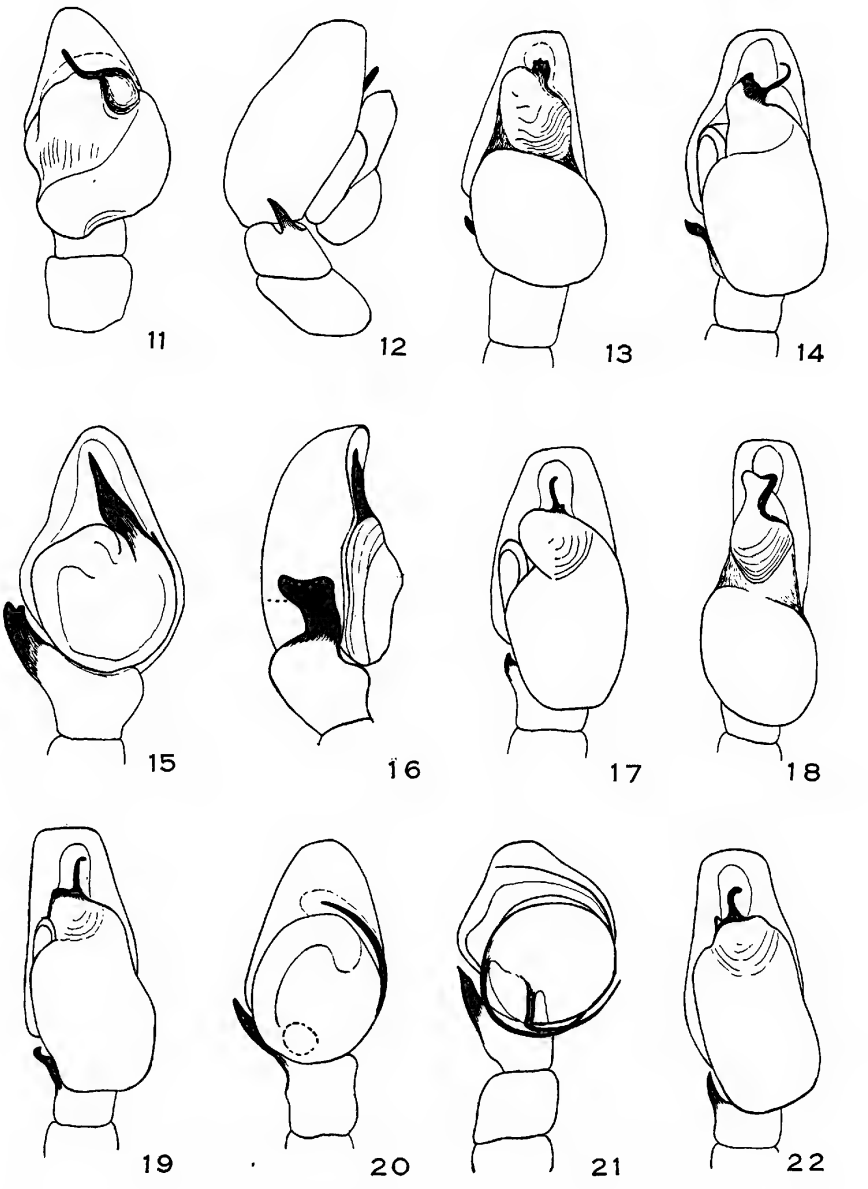
Pars cephalica flat above, the sides moderately expanded, convex, the posterior declivity beginning two-thirds of the length behind and abruptly dropping to the caudal margin. First row of eyes recurved, the medians much larger (20/10), one-fourth of a diameter from the clypeal margin, separated from each other by one-fifth of a diameter, a little farther from the laterals. Eyes of the second row very small, scarcely twice as far from the posterior eyes as their distance from the anterior laterals. Third eye row wider than the first (32/27), about three-fourths as wide as the breadth of the carapace at that point. Quadrangle of eyes a little more than two-fifths as long as the length of the carapace.

Leg formula 1423. The first leg greatly enlarged, the tibia and patella scarcely as long as the carapace, the tibia with three pairs of spines on the distal portion of the ventral face. Labium a little longer than broad, half as high as the maxillae, which have a poorly developed hook on the outer side. Chelicerae with a single tooth on the lower margin. Posterior coxae subcontiguous.

Male palpus light brown, the distal portion of the femur and the patella and tibia overlaid with white scales. Patella about equal in length to the tibia, which is armed with a short, black spur, directed ventrad. The details of the bulb and the embolus are nearly identical with Peckham's figure of *Phidippus tyrelli*.

TYPE LOCALITY.—Male holotype from hot springs near Bear Lake, Idaho, August 12, 1931 (Gertsch).

This species may be easily confused with *Phidippus insignarius* (C. Koch) or *P. tyrelli* Peckham. In the latter species the white band almost completely margins the carapace, which is not true of the other species. The fringes on the legs of *insignarius* are all white, are black in *concinnus*, and are both black and white in *tyrelli*.



PALPI AND EPIGYNA

Figs. 11–12. *Peckhamia idahoana*, new species.
Fig. 13. *Phidippus altanus*, new species.
Fig. 14. *Phidippus adumbratus*, new species.
Figs. 15-16. *Pellenes shoshonensis*, new species.
Fig. 17. *Phidippus concinnus*, new species.
Fig. 18. *Phidippus peritus*, new species.
Fig. 19. *Phidippus kaibabensis*, new species.
Fig. 20. *Sassacus aemulus*, new species.
Fig. 21. *Pellenes altanus*, new species.
Fig. 22. *Metaphidippus paiutus*, new species.

Metaphidippus paiutus, new species

Figure 22

MALE.—Total length, 3.65 mm. Carapace, 1.80 mm. long, 1.25 mm. wide.

Integument of the cephalothorax dark brown to black, closely overlaid with white scales on the sides and in a band along the frontal margin, the area delimited by the eyes slightly iridescent. Sternum, mouth parts and chelicerae brown. Femur of the first leg dark brown, the remaining joints lighter, the posterior legs yellow, all sparsely clothed with white hairs. Abdomen brown, closely overlaid with white scales.

Carapace flat above, the sides gently rounded, the widest point just behind the last eye row. First row of eyes recurved, the large medians almost contiguous, farther from the laterals. Eyes of the second row very small, twice as far from the posterior eye as the anterior lateral. Posterior eye row broader than the anterior (49/40), the eyes slightly smaller than the anterior laterals, the quadrangle formed by the laterals of the two rows three-fourths as long as broad. Chelicera robust, vertical in position, the fang curved distally, fitting into a groove formed by the large tooth of the lower margin and two on the upper, the teeth elevated on a large tubercle.

Legs 1423, the first much longer and heavier than the others, the tibia with 1–2–1 spines beneath in the distal half. Male palpus as figured.

TYPE LOCALITY.—Male holotype from Richfield, Utah, July 4, 1931. Male paratypes from St. George, Utah, July (Davis).

Metaphidippus nigromaculatus (Keyserling)

Icius nigromaculatus KEYSERLING, 1884, Verh. k.k. zool.-bot. Gesell., Wien, XXXIV, p. 500, Pl. XIII, fig. 9.

Dendryphantes jeffersoni EMERTON, 1909, Trans. Connecticut Acad. Arts and Sci., XIV, p. 225, Pl. XI, fig. 3.

On page 363 of the 'Revision of the Attidae of North America,' the Peckhams state, after having reviewed all the types of the family deposited in museums in the United States, that "*Icius nigromaculatus* is a good species, belonging to *Dendryphantes*." In the taxonomic section, however, the species is left in *Icius*, either inadvertently or because of the impossibility of changing the text at that stage in the publication. The specimen they describe should be referred to some other species. Keyserling's type was from Utah, where the species is common.

Metaphidippus helenae (Banks)

Dendryphantes helenae BANKS, 1921, Proc. California Acad. Sci., (4) XI, pp. 101–102, fig. 5.

Dendryphantes sausalitanus CHAMBERLIN, 1924, idem, XIV, pp. 137–138, fig. 57.

I have examples of this species from Richfield and Fish Lake, Sevier County, Utah. No doubt it will be found generally distributed from the Rocky Mountains to the Pacific coast.

Metaphidippus vitis (Cockerell)

Dendryphantes vitis Cockerell, 1894, Entomologist, XXVII, p. 207.

Icius vitis Peckham, 1909, Trans. Wisconsin Acad. Sci., XVI, p. 501, Pl. xl, fig. 11, Pl. xlj, fig. 7.

Dendryphantes apachecus Chamberlin, 1924, Proc. California Acad. Sci., (4) XIV, pp. 136–137, Figs. 55 and 56.

The generic position of this species and others that were placed in *Icius* by Peckham is somewhat dubious. For the present I am referring it to *Metaphidippus* where other closely related species have been placed. *M. vitis* is a common species in the southwestern States.

Paraphidippus marginatus (Walckenaer)

Attus marginatus Walckenaer, 1837, 'Histoire naturelle des Insectes Aptères,' I, p. 466.

Phidippus molinor Chamberlin, 1925, Proc. California Acad. Sci., (4) XIV, p. 133, Fig. 49.

Metacyrba floridana, new species

Female.—Total length, 5.85 mm. Carapace, 2.20 mm. long, 1.33 mm. wide. Abdomen, 3.60 mm. long, 1.42 mm. wide.

Cephalothorax provided with a few weak spines on the clypeus and between the eyes of the first row. Carapace black, thickly overlaid with minute, shining black scales, the margins of the pars thoracica with a single row of white scales. Sternum, labium, endites, and first coxae brown, the other coxae and the last three pairs of legs yellowish brown. Femur, metatarsus, and tarsus of the first leg yellowish brown, the patella and tibia darker. Abdomen almost black, without lighter markings on the integument but with remnants of a line of white scales on each side. Venter dusky.

Cephalothorax flat for most of its length, convex behind and on the sides. Eyes of the first row recurved, the upper margins in a straight line, subcontiguous, the medians much larger (17/7). Eyes of the second row very small, slightly nearer the anterior laterals than the posterior eyes (10/12). Posterior eye row nearly as wide as the greatest cephalothoracic width (59/64), broader than the first row (59/55), the eyes smaller (5/7) than the anterior laterals. Quadrangle of posterior eyes and the anterior laterals much broader than long (59/33). Clypeus very narrow, the anterior median eyes practically marginal.

Sternum twice as broad as long, the first coxae and the last pair contiguous. Chelicerae with a single small tooth on the lower margin. Leg formula 1423, the first leg greatly enlarged, the femur incrassate dorsoventrally, the sides almost flat. Tibia I with two pairs of very small spines near the distal end beneath, the first metatarsus with two somewhat longer pairs. Abdomen more than twice as long as broad, gently rounded on the sides. Epigynum almost identical with that of *Metacyrba taeniola* (Hentz).

Type Locality.—Female holotype from Fort Meyers, Florida, March 30, 1912.

Only two other species of *Metacyrba* are known from the Americas. *M. floridana* is much more elongate than the common species from the

United States, *M. taeniola*, both the cephalothorax and the abdomen being much longer than in that species. The quadrangle of the anterior laterals and the posterior eyes is 59:33 in *floridana*, 60: 38 in *taeniola*.

Pellenes shoshonensis, new species

Figures 15 and 16

MALE.—Total length, 3.50 mm. Carapace, 1.90 mm. long, 1.30 mm. wide. Abdomen, 1.70 mm. long, 1.00 mm. wide.

Integument of the carapace brown to black, clothed with white scales and a few spines, the clypeus and the frontal margin with short, reddish scales. Carapace with a dark band from the posterior eyes to the caudal margin, the sides with a marginal black stripe. Legs mottled with black, clothed with white scales. Abdomen with a narrow, median, longitudinal white stripe running the full length above, the sides and venter lighter, all thickly clothed with white scales.

Area of the eyes occupying two-fifths of the length of the carapace. Eyes of the first row recurved, equidistantly spaced, the medians about half a diameter from the clypeal margin, twice as large as the laterals. Eyes of the second row very small, midway between the two rows. Third row of eyes very slightly broader than the first, the eyes smaller than the anterior laterals. Ocular quadrangle much broader than long (40/25).

Palpus thickly overlaid above with white scales. Patella a little longer than the tibia, the latter with a very heavy apophysis that appears notched from the ventral aspect but, when viewed from the side, is nearly as broad as long, basally narrowed, slightly hooked distally. The bulb is oval, the inner side with a very heavy, straight black tube that ends acutely.

TYPE LOCALITY.—Male holotype from Adelaide, Idaho, May 15, 1931 (D. E. Fox).

The character of the embolus will distinguish this species from all others but *Pellenes peninsularis* Emerton, *P. limatus* Peckham, and *P. longimanus* Emerton. In all these forms the tibial apophysis is heavy at the base and pointed at the distal end, which is not true for *P. shoshonensis*, new species.

Pellenes captiosus, new species

MALE.—Total length, 4.75 mm. Carapace, 2.45 mm. long, 1.82 mm. wide. Abdomen, 2.25 mm. long, 1.62 mm. wide.

Integument of the carapace black, with a narrow frontal band of white scales and scattered white scales on the posterior declivity. Area of the eyes overlaid with inconspicuous, shining black scales. Frontal margin and clypeus provided with long brown hairs. Chelicerae brown, mouth parts dusky, the sternum and coxae yellow, all rather thickly clothed with long white hairs. First leg yellow, modified as follows: femur, patella, and tibia with heavy, double, subventral fringes of yellowish hairs, the tibia armed with two spatulate spines on the inner side; dorsum and sides of the joints thickly clothed with white scales. Second legs with a short ventral fringe of yellowish white hairs. Third leg strikingly modified as follows: femur mostly brown,

distally strongly thickened; patella brown, medially thickened, the dorsum with a fringe of black hairs, the distal end produced into a light-colored lobe that overlaps the tibia; distal joints yellow. Last leg yellow, the distal end of the femur and the patella brown above, all the joints thickly overlaid with white scales and hairs. Abdomen black, basally with a white band, the sides with a medial oblique white dash, the caudal end with two white dots and an elongate white maculation. Venter light.

Eyes of the first row recurved, their upper margins in a straight line, the larger medians one-fifth of their diameter apart, twice as far from the laterals. Eyes of the second row very small, midway between the anterior laterals and the eyes of the third row. Posterior eye row slightly broader than the first (59/55), the quadrangle formed by these eyes nearly twice as broad as long. Clypeus half as high as the diameter of an anterior median eye.

Leg formula 1423, the first tibia with 2–2–2 spines beneath, two spatulate, the metatarsi with two pairs.

Palpus covered with white and yellow hairs. Palpal organ identical in structure with that of *Pellenes borealis* Banks, which this species closely resembles.

TYPE LOCALITY.—Male holotype and paratype from Barnum, Minnesota, June, 1932 (J. E. Moore).

The only important difference between this species and *P. borealis* Banks is the remarkable modification of the first and third legs.

Pellenes altanus, new species

Figure 21

MALE.—Total length, 3.80 mm. Carapace, 1.82 mm. long, 1.40 mm. wide. Abdomen, 1.50 mm. long, 1.15 mm. wide.

Integument of the cephalothorax black, the eye quadrangle overlaid with white scales that are thicker on the frontal margin, forming a narrow band, the sides and posterior declivity with scattered white scales. Clypeus dark brown, the mouth parts, sternum, and coxae yellowish brown. Legs yellowish brown, the first femur black on the sides, the other femora with black maculations, the patellae, tibiae, and metatarsi of all the legs with a subventral narrow black stripe on the prolateral face of the joints. Legs sparsely clothed with black hairs. Abdomen black above, somewhat spotted and flecked with white, the venter light. Tarsus of the palpus clothed with short orange scales.

Eyes of the first row recurved, the large medians one-eighth of their diameter apart, twice as far from the laterals. Small eyes of the second row midway between the anterior laterals and the posterior eyes. Third row of eyes broader than the first (44/40), the quadrangle formed by the laterals broader than long (44/36). Eye area occupying three-sevenths of the length of the carapace.

Leg formula 3412, the first pair of legs not much stouter than the others, lacking fringes or peculiar ornamentation, the tibiae with 1–1–2 spines beneath. Third leg unmodified, with two unpaired spines beneath and two prominent prolateral spines that project dorsad. Palpus as figured.

TYPE LOCALITY.—Male holotype from Medicine Hat, Alberta, August 1, to 16, 1930. Male paratype from Saskatoon, Saskatchewan.

Sassacus aemulus, new species

Figure 20

MALE.—Total length, 3.00 mm. Carapace, 1.50 mm. long, 1.17 mm. wide. Abdomen, 1.50 mm. long, 1.12 mm. wide.

Frontal margin of the carapace with a few short spines and white scales. Ocular quadrangle black, closely overlaid with small iridescent purple scales. Sides of carapace and the posterior declivity reddish brown, the margin with a narrow band of white scales. Sternum and labium black, the coxae and endites light brown. First leg strikingly modified as follows: femur, patella, and tibia greatly thickened dorsoventrally, flattened on the sides; femur black, patella and tibia reddish brown, both with a heavy ventral fringe of coarse black hairs, the tibia with an additional shorter dorsal fringe; metatarsus yellow, tarsus brown. Posterior three pairs of legs considerably shorter and weaker, the basal joints light brown, the metatarsi and tarsi yellow. Abdomen black, lacking basal bands or lighter color markings, covered with iridescent white scales and inconspicuous dark hairs.

Eye area occupying seven-twelfths of the length of the flat dorsum of the carapace. First row of eyes recurved, the medians much larger (12/7) than the laterals, about one-third their diameter from the clypeal margin. Eyes of the second row very small, slightly nearer the anterior lateral than the posterior eye (10/12). Posterior eye row marginal, broader than the first row (38/45), the eyes about equal to the anterior laterals, the quadrangle of the anterior and posterior eyes broader than long. Sides of the carapace nearly vertical, the posterior declivity abrupt, beginning well behind the third eye row.

Leg formula 1423, the enlarged first tibia with a single submedian, retrolateral spine and a pair near the distal end, the metatarsus with two pairs beneath, the last pair distal. Chelicerae with a single short tooth on the lower margin. Labium broader than long, about half as high as the slightly convergent endites. Sternum longer than broad, the last coxae contiguous, the first separated by their width.

Male Palpus.—Femur as long as the tarsus, longer than the equal tibia and patella. Tibia with a retrolateral black spur, acutely ended, nearly as long as the joint. Bulb oval, the embolus a slender curved tube that is free at the middle of the bulb on the prolateral side.

TYPE LOCALITY.—Male holotype from Itasca Park, Minnesota, May 29–30, 1932 (Gertsch).

This species is closely related to *Sassacus barbipes* Peckham and *S. dentata* F. Cambridge, both of which were placed in *Ashtabula* by Cambridge. The embolus is terminal in both of these forms, which is not true for *aemulus*. *Sassacus barbipes* has a basal light band on the abdomen and the tibia lacks the dorsal fringe of coarse black hairs. The important differences between these forms and the typical species of *Sassacus* (*papenhoei* Peckham and *smaragdinus* Barrows) seem to warrant their separation into another genus.

AGELENIDAE

The first species described below was sent to me by Dr. W. M. Barrows, who diagnosed the species as new and requested that I describe it. He has generously given the types to The American Museum of Natural History. The second species, collected by Mr. Stanley Mulaik at Edinburg, Texas, is closely related and shares the unusual palpal characters of *Agelena barrowsi*.

Agelena barrowsi, new species

Figures 8 and 9

MALE.—Total length, 4.35 mm., exclusive of the spinnerets. Carapace, 2.10 mm. long, 1.50 mm. wide. Abdomen, 2.30 mm. long, 1.40 mm. wide.

Integument of the cephalothorax yellow, clothed with a few short, inconspicuous black hairs. Eyes in a black field. Carapace with a submarginal light band and a narrow black marginal seam, medially with two poorly defined dusky bands, the interval between them light. Labium dusky, the endites pale, the sternum black but with a median pale stripe. Legs irregularly maculate with black, the distal end of the metatarsi with a narrow black ring. Dorsum of the abdomen with a longitudinal light band, tinged with red, broken caudally by transverse black bands. Sides of the abdomen black, the venter paler and furnished with two narrow black longitudinal bands.

Eyes of the first row strongly procurved, the medians slightly larger, subcontiguous. Second row of eyes strongly procurved, the medians slightly smaller, placed about one-half of their diameter apart. Median ocular quadrangle slightly longer than broad (7/6), about as wide in front as behind, the posterior median eyes smaller. Lateral eyes of both rows subequal and subcontiguous. Clypeus one-third as high as the diameter of an anterior lateral eye. Chelicerae with three teeth on the lower margin.

Spines under the first two tibiae, 2–2–0, the metatarsi, 2–2–2. Tibia and patella I equal in length to tibia and patella IV, longer than the carapace (20/17). Distal joint of the posterior spinneret slightly longer than the basal.

Male Palpus.—Patella slightly longer than broad, longer than the tibia, which is armed on the outer side with a stout spur as in *A. naevia*. Bulb expanded, the inner side provided with a slightly curved, robust, brown apophysis that ends in a sharp point. Conductor a short, sclerotized spur that, in lateral view, is deeply notched at the free end. Embolic portion a brown tube, originating near the inner basal margin, strongly and tightly wound; the embolus proper is free at that point as a strongly ridged, flattened tube, making nearly two and a half turns, becoming progressively narrower, and ending as fine acuminate tube. The spirals are at right angles to the long axis of the tarsus, not on the same plane as in *Agelena naevia, potteri, utahana*, etc., and the acuminate tip exceeds the distal end of that joint.

FEMALE.—Total length, 6.00 mm., exclusive of the spinnerets. Carapace, 2.80 mm. long, 1.90 mm. wide. Abdomen, 3.90 mm. long, 2.10 mm. wide.

Color darker than in the male, the legs with larger black maculations, the distal annulae of the metatarsi well marked. Spinnerets as in the male, the distal joint of the posterior pair slightly longer than the basal (0.52 mm./0.42 mm.). Vulva half as

long as broad, transversely elliptical, strongly rounded in front and the margin at that point provided with two small, rounded, colorless lobes. Atrial cavity, as seen from the caudal view, divided by a broad median septum, which is not apparent from the ventral aspect.

TYPE LOCALITY.—Male holotype from Fort Meyers, Florida, February, 1930 (W. M. Barrows). Female allotype and two female paratypes from Gainesville, Florida, February 12, 1925 (W. M. Barrows).

The female of *A. barrowsi* is of the conventional type and might easily be confused with such species as *Agelena utahana* Chamberlin and Ivie or *A. potteri* Blackwall. The male, however, is radically different in palpal characters from all other American species, except *A. texana.*

Agelena texana, new species

MALE.—Total length, 8.25 mm., exclusive of the spinnerets. Carapace, 4.25 mm. long, 3.10 mm. wide. Abdomen, 4.15 mm. long, 2.00 mm. wide.

Integument in general a little darker than in *A. barrowsi* but color markings exactly as in that species. Eyes of the first row strongly procurved, equal in size, subcontiguous. Posterior row of eyes strongly procurved, the medians smaller, the eyes about a diameter apart, the laterals smaller than the anterior laterals. Median ocular quadrangle longer than broad (25/20), slightly narrower behind, the anterior medians much larger. Clypeus a little higher than the diameter of an anterior lateral eye.

Sternum nearly as broad as long, the anterior coxae separated by their length, the posterior subcontiguous. Labium slightly broader than long, half as high as the parallel endites. Chelicerae armed with four stout, subequal teeth on the lower margin, the upper with three. Leg formula 4123. First tibia with 2–2–0 ventral spines, the distals missing; the second tibia 1–1–0, the prolaterals missing, as well as the distals; the metatarsi of these legs with 2–2–2 spines beneath. Patella and tibia of the fourth leg equal in length to the carapace, those joints of the first leg a little longer. Spinnerets short, the basal joint of the posterior pair two-thirds as long as the distal (0.50 mm./0.80 mm.).

Male Palpus.—The genital organ of the male differs only in minor details from that of *A. barrowsi.* The tibial apophysis is a heavy spur, retrolateral in position, that has the same form as in *A. nacvia* and other species. The process on the inner side of the bulb near the base is heavily sclerotized, brown in color, curved and rounded at the end, as viewed from the ventral aspect. The conductor is deeply notched as in *A. barrowsi* and the embolic portion has almost the same form. The embolus proper is a strongly ridged, heavy, somewhat flattened tube, the inner margins white, which is tightly coiled for two turns, the free acuminate tip going to the end of the cymbium.

TYPE LOCALITY.—Male holotype from Edinburg, Texas (S. Mulaik).

The greater size of this species, the presence of four teeth on the lower cheliceral margin and the slight differences in the embolus will separate it from *A. barrowsi.*

Agelena idahoana, new species

Figure 5

FEMALE.—Total length, 9.40 mm. Carapace, 4.00 mm. long, 3.20 mm. wide. Abdomen, 5.70 mm. long, 3.00 mm. wide.

Integument of the cephalothorax and legs dark brown, without contrasting markings. Abdomen dark brown above, evenly and densely maculate with small yellow spots, the venter with light stripes on the sides.

Eyes of the first row procurved, equidistantly spaced about one-third of a diameter apart. Second row of eyes procurved, equal in size and spaced four-fifths of a diameter apart. Median ocular quadrangle slightly longer than broad (22/19), as broad in front as behind, the anterior median eyes slightly larger. Clypeus equal in height to one and one-half times the diameter of an anterior lateral eye. Chelicerae with two subequal teeth on the lower margin, the upper with three unequal denticles.

Legs rather slender, all the tibiae with 2–2–2 spines beneath, the tibia and patella of the fourth pair longer than the carapace (5.00 mm./4.00 mm.), those joints of the first leg equal in length to the carapace. Spinnerets rather short, the basal joints of the anterior and posterior pair subequal, the distal joint of the posterior pair about equal to the basal joint.

Epigynum as figured.

TYPE LOCALITY.—Female holotype from Montpelier, Idaho, August, 1931 (Gertsch).

The unmarked carapace and unbanded legs, the short distal joint of the hind spinnerets, and the quite different epigynum will separate this species from *Agelena californica* Banks. In Bank's species the eyes of both rows are about equal in size and the median ocular quadrangle is slightly narrowed in front.

Agelena aperta, new species

Figure 10

MALE.—Total length, 11.00 mm. Carapace, 5.30 mm. long, 3.80 mm. wide. Abdomen, 6.30 mm. long, 3.30 mm. wide.

Integument of the cephalothorax bright yellow, clothed with short, inconspicuous, black and white hairs. Carapace with two black stripes above and a dark marginal seam. Mouth parts, sternum, and legs bright yellow, unmarked. Abdomen gray above, with two white stripes that are broken into spots in the caudal half, the venter gray.

Eyes of the first row procurved, equal in size, separated by a radius. Second row of eyes procurved, slightly smaller than the anterior row, separated by a a diameter. Median ocular quadrangle slightly longer than broad (21/19), though apparently much more so, as wide behind as in front, the posteriors smaller. Clypeus equal in height to twice the diameter of an anterior median eye. Chelicerae with three subequal teeth on the lower margin (four on one side in the male holotype), the upper margin with three unequal teeth.

Spines under the tibiae 2–2–2, the distals often unpaired, under the first metatarsi 2–2–2. Tibia and patella I about equal in length to tibia and patella IV, longer

than the carapace (21/16). The same comparisons in *Agelena naevia* give a ratio of about 21:12. Distal joint of the posterior spinneret more than twice as long as the basal (24/10).

Male Palpus.—Structure as in *Agelena naevia* Walckenear, the chief difference being in the embolus, which is proportionately heavier, broadly encircles the periphery of the tarsus for one and a quarter turns, is little diminished in size throughout its length, and has the heavy tip folded and twisted, not acuminate as in *naevia*.

Female.—Variation in size in this sex is considerable. The smallest female measures 10.00 mm., the largest 19.00 mm., exclusive of the spinnerets. In structure and color the females agree well with the males but are usually a little darker and have the white spots on the abdomen better defined. The epigynum closely resembles that of *Agelena naevia* but in all examples lacks the prominent lobe that projects caudally into the atrial cavity in *naevia*. That margin in *aperta* may be either straight or distinctly notched. The distal joint of the hind spinnerets is over twice as long as the basal.

Type Locality.—Male holotype, female allotype, and paratypes of both sexes from Valmont Buttes, east of Boulder, Colorado, July 27, 1908 (F. E. Lutz). Paratypes from Boulder, Colorado (Cockerell); Austin, Texas, September, 1909 (Petrunkevitch); Salt Lake City, Utah, July, September, 1931 (Gertsch); Zion National Park, Utah, July 4, 1931 (Gertsch); Los Angeles, California, November, December (Grant).

Representatives of this species have been consistently referred to *Agelena naevia* Walckenaer, which is a complex found to include several well-marked species. The distribution of this species or subspecies is essentially western. The differences in the genitalia are constant throughout a large series of specimens.